REMARKS

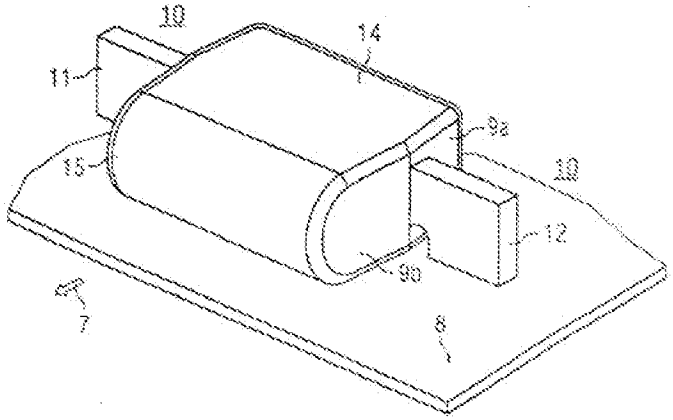
Claims 1-2 and 4-86 are pending. Independent claim 1 and claims 2, 7, 14 and 15 are presented for examination.

The examiner rejected claims 1, 3, 7, 14 and 15 under 35 USC § 112, second paragraph. Specifically, the examiner asked, with respect to claim 1, "[w]hat has a shape defining a mounting surface of the component?" (Final Action, page 2), and also asked "[w]here are the claimed connection surfaces enclosing a second predetermined angle with what mounting surface?" (Final Action, page 3).

In response, applicant amended independent claim 1 to clarify that it is the molding material that has a shape defining a mounting surface. Applicant further amended claim 1 to clarify that it is the connection surfaces of the leadframe connections that enclose a second predetermined angle with the mounting surface (i.e., the mounting surface of the molding material). Applicant amended claim 1 to further clarify that it the first predetermined angle that has a value lying between 0-20°, that it is the leadframe connections that protrude from the molding material, and that it is the second predetermined angle that has a value lying within a range of 70-90°.

To facilitate understanding of applicant's independent claim 1, provided below is FIG. 3 of the above-identified application, which shows an illustration of an exemplary embodiment of applicant's component.

FIG 3



As shown, applicant's component includes a molding material that encases a leadframe and a radiation-emitting chip mounted on the leadframe. The molding material has a shape defining a mounting surface (i.e., the surface that is subsequently mounted on a target surface; in the above drawing the mounting surface is the surface that contacts target surface 8). That mounting surface extends at an angle of 0-20° with respect to the main emission direction. In the above drawing, the direction of emission is indicated by the arrow 7. In other words, the mounting surface of applicant's component is approximately parallel to the emission direction of the component, or slightly skewed (up to 20 degrees) with respect to the main emission direction. This design facilitates sideway illumination of the target surface on which applicant's component is mounted.

Applicant's component also includes a leadframe whose connections (marked 11 in FIG. 3 above) protrudes from the sides of the molding material encasing. The connection surfaces of the leadframe are the surfaces of the respective leads of the leadframe to which the radiation-emitting chip is mounted. Those connection surfaces of the leadframe enclose a second angle with the mounting surface of the molding material, and that angle has a value of 70-90°. As explained in the application, "[t]his design [of the leadframe] permits both economical manufacture of the leadframe, for example by punching out a metal sheet or of a foil without additional bends, and a very small space requirement of the component" (page 19, lines 20-23).

The molded encasing of applicant's component also has a curved surface in the main emission direction, thus enabling applicant's component to create, in some embodiments, "a lens effect and hence focusing of the emitted radiation" (page 22, lines 4-5 of the originally filed application). The curved surface is indicated by reference numeral 15 in the above drawing.

Accordingly, applicant submits that with the clarifying amendments of "the molding material having a shape defining a mounting surface of the component" and "wherein said leadframe connections enclose a second predetermined angle with said mounting surface," the examiner's concerns as presented in the examiner's rejection of the claims under 35 U.S.C. § 112, second paragraph, have been addressed.

The examiner rejected claims 1-3, 7, 14 and 15 under 35 USC § 102 as being anticipated by several references, including U.S. Patent Publication No. 2003/0168670 to Roberts et al., U.S.

Patent No. 6,472,765 to Sano et al., U.S. Publication No. 2002/0028527 to Maeda et al., U.S. Patent No. 6,006,861 to Hohn et al., and U.S. Patent No. 6,576,930 to Reeh et al.

As explained below, none of the references cited by the examiner discloses applicant's component design as recited in independent claim 1, including the feature of "the molding material having a shape defining a mounting surface of the component, said mounting surface extending at a first predetermined angle, said first predetermined angle having a value lying within a range from 0° to 20° relative to a main emission direction of the component."

U.S. Patent Publication No. 2003/0168670 to Roberts

In rejecting applicant's independent claim 1 as being anticipated by Roberts, the examiner stated:

> 1. Roberts et al. (figures 1 to 16) specifically figures 3 and 15 show a surface-mounting radiation-emitting component, comprising: ... said mounting surface extending at a first predetermined angle having a value lying within a range from 0 degrees to 20 degrees relative to a main emission direction of the component (Note: by including the 0 degrees refer that range can be 0 degrees relative to a. main emission direction of the component)... (Final Action, page 4)

Applicant respectfully disagrees.

Roberts describes a radiation emitting device that includes at least one radiation emitter (Abstract). Specifically, Roberts' FIG. 3 shows a radiation emitting device that includes a radiation emitting chip 35, a first and second electrical leads 14 and 16 and a molding material 30. As shown, the electrical leads 14 and 16 extend in a direction that perpendicular to the surface near the rim 22. The surface near the rim 22 is the mounting surface of Roberts' device (i.e., the surface that contacts or is closest to the target surface into which the leads 14 and 16 are connected.) Radiation from Robert's device extends from the curved surface of the encapsulant 12, which acts as a lens (Roberts refers to the encapsulant material 12 as a lens in several places, for example, at page 8, paragraph 85). Accordingly, unlike applicant's claimed component, the mounting surface of the embodiment of Robert's device shown in FIG. 3, as well as in the embodiments shown in Roberts' other drawings (see FIGS. 14-16) is perpendicular to the main direction of emission of Roberts' device. Roberts, therefore, does not disclose or suggest at least the feature of "the molding material having a shape defining a mounting surface of the

component, said mounting surface extending at a first predetermined angle, said first predetermined angle having a value lying within a range from 0° to 20° relative to a main emission direction of the component," as required by applicant's independent claim 1.

Applicant's independent claim 1 is therefore patentable over Roberts.

U.S. Patent No. 6,472,765 to Sano

In rejecting applicant's independent claim 1 as being anticipated by Sano, the examiner stated:

> 1. Sano et al. (figures 1 to 4) specifically figure 1 show a surface-mounting radiation-emitting component, comprising: a leadframe 1,2 and a radiation-emitting chip 3 mounted on said leadframe; a molding material 11 encasing said leadframe and said radiation-emitting chip and having a shape defining a mounting surface of the component, said mounting surface extending at a first predetermined angle having a value lying within a range from 0 degrees to 20 degrees relative to a main emission direction of the component (Note: by including the 0 degrees refer that range can be 0 degrees relative to a main emission direction of the component) ... (Final Action, pages 5-6)

Applicant respectfully disagrees.

Sano describes a semiconductor light emitting device with a light-permeating cover that converts light emitted from a light-emitting element into a different wavelength (Sano, col. 1, lines 9-16). Specifically, Sano's device includes leads 1 and 2, a semiconductor light emitting element 3, and a plastic encapsulant 9 that seals each of the leads 1 and 2. Sano explains that "[t]he plastic encapsulant 9 comprises a sealing portion 10 formed into a substantially cylindrical shape, and a lens portion 11 formed into a substantially hemispherical shape integral with the sealing portion 10" (col. 3, lines 19-22). A light-permeating cover 20, containing light converting fluorescent particles 16, surrounds the encapsulant 9 (FIG. 1, and col. 3, lines 16-19). Although not explicitly stated, as shown in Sano's FIG. 1, the bottom part of sealing portion 10, from which the leads 1 and 2 protrude, defines the mounting surface of Sano's device, i.e., the surface that contacts or is closest to the target surface into which the electrical leads 1 and 2 are connected.

As Sano further explains:

> **As the semiconductor light emitting element 3 emits intense light of the extremely sharp directivity at the tip of the lens portion 11 of the plastic**

> **encapsulant 9, a greater number of fluorescent particles 16 are positioned in the cover 20 near the tip of the lens portion 11 of the plastic encapsulant 9 to increase the amount of light impinging on the fluorescent particles 16. (col. 3, lines 41-47).**

Thus, the main emission direction of Sano's device extends from the tip of the lens portion 11 and the corresponding tip portion of cover 20. Therefore, as seen from Sano's FIG. 1, the mounting surface of Sano's device is substantially perpendicular to the main emission direction of the device. Accordingly, contrary to the examiner's contentions, Sano also does not disclose or suggest at least the feature of "the molding material having a shape defining a mounting surface of the component, said mounting surface extending at a first predetermined angle, said first predetermined angle having a value lying within a range from 0° to 20° relative to a main emission direction of the component," as required by applicant's independent claim 1.

Applicant's independent claim 1 is therefore patentable over Sano.

U.S. Publication No. 2002/0028527 to Maeda

In rejecting applicant's independent claim 1 as being anticipated by Meada, the examiner stated:

> 1. Maeda et al. (figures 1 to 15b) specifically figures 8 show a surface-mounting radiation-emitting component, comprising: a leadframe 60A,60B and a radiation-emitting chip 5 mounted on said leadframe; a molding material 63A encasing said leadframe and said radiation-emitting chip and having a shape defining a mounting surface of the component, said mounting surface extending at a first predetermined angle having a value lying within a range from 0 degrees to 20 degrees relative to a main emission direction of the component (Note: by including the 0 degrees refer that range can be 0 degrees relative to a main emission direction of the component) ... (Final Action, pages 6-7)

Applicant respectfully disagrees.

Maeda describes a light-emitting device that includes a light-emitting element implemented as multiple semiconductor layers stacked on a transparent substrate, and a resin member (page 1, paragraph 1). Specifically, as shown, for example, in Maeda's FIG. 8, Maeda's device includes a leadframe having ends 60A and 60B. A diode 2 is connected to a die pad at the bottom of a reflective cup 60a that extends from the lead 60A (page 8, paragraph 114). The ends 60A and 60B of the leadframe and the reflective cup 60a are molded together within a resin

encapsulant 63A. Although not explicitly stated, as shown in Maeda's FIG. 8, the bottom part of the encapsulant 63A, from which the leads of the leadframe protrude, defines the mounting surface of the device, i.e., the surface that contacts or is closest to the target surface into which the leadframe is connected.

Maeda further explains that "[t]he upper half of the resin encapsulant 63A is molded in a hemispherical shape" (page 9, paragraph 116). The hemispherically-shaped upper half of the encapsulant 63A presumably acts as a lens through which light emitted by Maeda's device is directed. Thus, as seen in FIG. 8, as well as in the other similarly structured embodiments of Maeda's device, the mounting surface of the device is perpendicular to the main direction of light emission of the device. Accordingly, Maeda also does not disclose or suggest at least the feature of "the molding material having a shape defining a mounting surface of the component, said mounting surface extending at a first predetermined angle, said first predetermined angle having a value lying within a range from 0° to 20° relative to a main emission direction of the component," as required by applicant's independent claim 1.

Applicant's independent claim 1 is therefore patentable over Maeda.

U.S. Patent No. 6,006,861 to Hohn

In rejecting applicant's independent claim 1 as being anticipated by Hohn, the examiner stated:

> 1. Hohn et al. (figures 1 to 8) specifically figure 4 show a surface-mountable radiation-emitting component, comprising: a leadframe 1,16,2 and a radiation-emitting chip 1,7 mounted on said leadframe; a molding material 5,10 encasing said leadframe and said radiation-emitting chip and having a shape defining a mounting surface of the component, said mounting surface extending at a first predetermined angle having a value lying within a range from 0 degrees to 20 degrees relative to a main emission direction of the component (Note: By including the 0 degrees refer that range can be 0 degrees relative to a main emission direction of the component) ... (Final Action, page 8)

Applicant respectfully disagrees.

Hohn describes a wavelength-converting casting composition (Abstract). Hohn further describes several embodiments in which such casting composition may be used in conjunction with a semiconductor body. For example, as shown in FIG. 4, a semiconductor component

includes a semiconductor body 1 secured to a first electrical terminal 2, and joined to another electrical terminal 3 (FIG. 4, and col. 8, lines 58-67). The semiconductor body 1 and terminals 2 and 3 are covered by a hardened wavelength-converting composition 5 containing a luminous substance 6 (col. 8, lines 63-65). The casting composition, in turn, is surrounded by a further transparent housing envelope 10 (col. 8, lines 66-67).

As further shown in FIG. 4, the bottom part of the encapsulation layer 10, from which the electrical terminals protrude, defines the mounting surface of the device. The top part of the encapsulation layer 10 has a curved structure, which presumably serves as a lens through which the radiation emitted by the device is directed. Accordingly, the mounting surface of Hohn's device is perpendicular to the main direction of light emission of the device. Hohn, therefore, does not disclose or suggest at least the feature of "the molding material having a shape defining a mounting surface of the component, said mounting surface extending at a first predetermined angle, said first predetermined angle having a value lying within a range from 0° to 20° relative to a main emission direction of the component," as required by applicant's independent claim 1.

Thus, applicant's independent claim 1 is patentable over Hohn.

U.S. Patent No. 6,576,930 to Reeh

In rejecting applicant's independent claim 1 as being anticipated by Reeh, the examiner stated:

> 1. Reeh et al. (figures 1 to 14) specifically figure 4 show a surface-mounting radiation-emitting component, comprising: a leadframe 2,16,3 and a radiation-emitting chip 1 mounted on said leadframe; a molding material 10 encasing said leadframe and said radiation-emitting chip and having a shape defining a mounting surface of the component, said mounting surface extending at a first predetermined angle having a value lying within a range from 0 degrees to 20 degrees relative to a main emission direction of the component (Note: by including the 0 degrees refer that range can be 0 degrees relative to a main emission direction of the component) ... (Final Action, pages 10-11)

Applicant respectfully disagrees.

Reeh describes a light-radiating semiconductor component that has a radiation-emitting semiconductor body and a luminescence conversion element (Abstract). Specifically, and with reference to FIG. 4, Reeh's device includes a semiconductor body 1, electrical terminals 2 and 3,

an encapsulation layer 15, and a luminescence conversion layer 4 that is directly enclosed by a further transparent encapsulation layer 10 (col. 13, lines 23-46).

As further shown in FIG. 4, the bottom part of the encapsulation layer 10, from which the electrical terminals protrude, defines the mounting surface of the device (i.e., the surface that contacts or is closest to the target surface to which the terminals 2 and 3 are connected.) The top part of the encapsulation layer 10 has a curved structure. As Reeh explains in relation to other embodiments of its device having similar curved cover structure, the curved structure serves as a lens through which the radiation emitted by the device is directed (see, for example, col. 12, lines 23-33). Accordingly, the mounting surface of Reeh's device is perpendicular to the main direction of light emission of the device. Therefore, Reeh does not disclose or suggest at least the feature of "the molding material having a shape defining a mounting surface of the component, said mounting surface extending at a first predetermined angle, said first predetermined angle having a value lying within a range from 0° to 20° relative to a main emission direction of the component," as required by applicant's independent claim 1.

Applicant's independent claim 1 is thus patentable over Reeh.

Conclusions

Because none of the references cited by the examiner discloses or suggests, alone or in combination, at least the feature of "the molding material having a shape defining a mounting surface of the component, said mounting surface extending at a first predetermined angle, said first predetermined angle having a value lying within a range from 0° to 20° relative to a main emission direction of the component," applicant's independent claim 1 is therefore patentable over the cited art.

Claims 2, 7, 14 and 15 depend from independent claim 1 and are therefore patentable for at least the same reasons as independent claim 1.

It is believed that all the rejections and/or objections raised by the examiner have been addressed.

In view of the foregoing, applicant respectfully submits that the application is in condition for allowance and such action is respectfully requested at the examiner's earliest convenience.

All of the dependent claims are patentable for at least the reasons for which the claims on which they depend are patentable.

Canceled claims, if any, have been canceled without prejudice or disclaimer.

Any circumstance in which the applicant has (a) addressed certain comments of the examiner does not mean that the applicant concedes other comments of the examiner, (b) made arguments for the patentability of some claims does not mean that there are not other good reasons for patentability of those claims and other claims, or (c) amended or canceled a claim does not mean that the applicant concedes any of the examiner's positions with respect to that claim or other claims.

Enclosed is a Request for Continued Examination, a Petition for One Month Extension of Time and a Supplemental Information Disclosure Statement.

The fees in the amount of $795 and $120 are being paid concurrently on the Electronic Filing System (EFS) by way of Deposit Account authorization. Please apply any other required fees to deposit account 06-1050, referencing the attorney docket number shown above.

Respectfully submitted,

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